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Indian Standard

SPECIFICATION FOR WHIPCORDS

(First Revision)

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SPECIFICATION FOR WHIPCORDS

(First Revision)

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Indian Standard

SPECIFICATION FOR WHIPCORDS

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 5 October 1981, after the draft finalized by the Cordage Sectional Committee had been approved by the Textile Division Council.

0.2 This standard is based on Specification No. IND/TC/2143 'Line, natural whipcord' and JSS 1252 'Lines, natural whipcord (tarred) ammunition' issued by the Ministry of Defence, Government of India.

0.3 Standards of Weights and Measures Act, 1976 stipulates the use of International System of Units in the country; in order to familiarize the industry with this system, the recommended SI units for use in the textile industry are given in Appendix B.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers natural, tarred and rotproofed whipcords made from jute, hemp and flax used in packing ammunition.

2. MATERIALS

2.1 The jute or hemp fibre used in case of natural whipcord and hemp or flax fibres in case of tarred whipcord shall be free from roots, tops and tappings.

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*Rules for rounding off numerical values (*revised*).

2.2 The yarn shall be clean, well dressed and evenly spun with S-Twist.

2.2.1 If so specified in the contract the whipcord shall be thoroughly and uniformly tarred with wood tar or coal tar (*see* IS : 216-1961*).

3. REQUIREMENTS FOR FINISHED WHIPCORDS

3.1 The whipcords (natural or tarred) shall meet the requirements given in Table 1.

TABLE 1 REQUIREMENTS FOR WHIPCORDS

SL No.	CHARACTERISTIC	REQUIREMENTS FOR		METHOD OF TEST
		Natural	Tarred	
(1)	(2)	(3)	(4)	(5)
i)	Size (dia), mm	$2^{+0\cdot5}_{-0}$	$1^{+0\cdot5}_{-0}$	IS : 7071 (Part III)-1974*
ii)	Linear density, g/m	4±5 percent	1·5±10 percent	IS : 7071 (Part II)-1974*
iii)	Breaking load, N (kgf), *Min*	490 (50)	205 (21)	IS : 7071 (Part IV)*
iv)	Length of skein, m, *Min*	100	100	IS : 7071 (Part II)-1974*
v)	Number of strands	3	3	——

*Methods of physical tests for ropes and cordages:
Part II Mass, length and linear density.
Part III Diameter, circumference and lay.
Part IV Breaking load and elongation at break (*under preparation*).

3.2 The tarred whipcord shall meet the following requirements also in addition to those given in **3.1**:

Characteristic	*Requirement*	*Method of Test*
Tar content, percent by mass	16-20	IS : 5152-1969†
*p*H of water extract	5·5-8	IS : 1390-1961‡
Chloride content as NaCl percent, *Max*	0·05	IS : 4202-1967§
Sulphate content as Na_2SO_4 percent, *Max*	0·25 percent	IS : 4203-1967¶

NOTE — If the material is supplied before tarring it shall comply with the tests given for *p*H, water soluble chlorides and water soluble sulphates.

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*Specification for coal tar pitch (*revised*).
†Method for estimation of benzene-methyl alcohol-soluble matter in textile materials.
‡Methods for determination of *p*H value of aqueous extracts of textile materials.
§Method for determination of chloride content in textile materials.
¶Method for determination of sulphate content in textile materials.

3.2.1 When 50 cm tarred whipcord is wrapped around a mandrel on which filter paper has already been folded and stored at 60°C for 2 hours, the filter paper shall not get stained.

3.3 The rotproofed whipcord shall have copper content at 0·5 to 0·8 percent when tested as given in Appendix A.

4. PACKING

4.1 The packaging, preservation, identification, etc, shall be as detailed in the contract.

5. MARKING

5.1 Each package shall suitably bear the following information:

a) Name of the material and whether tarred or rotproofed;
b) Gross and net mass of the package;
c) Number of skeins in the package and length (m)/skein;
d) Manufacturer's name and address/trade-mark; and
e) Month and year of manufacture.

5.1.1 The package may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6. SAMPLING

6.1 Lot — The quantity of whipcords of the same type (natural or tarred) delivered to a buyer against a despatch note shall constitute a lot.

6.2 Unless otherwise agreed to between the buyer and the seller, the number of skeins to be selected at random from a lot shall be as follows:

No. of Skeins in the Lot	*No. of Skeins to be Selected*
Up to 50	3
51 ,, 150	5
151 ,, 500	8
501 and above	13

6.3 The skeins selected according to **6.2** shall be inspected for length, linear density, diameter, breaking strength, and number of strands. For the remaining characteristics given under **3.2** and **3.3**, the number of skeins to be inspected shall be 2 if the lot size is less than 500 skeins and 3 otherwise.

6.4 Criteria for Conformity — The lot shall be considered conforming to the requirements of this standard if none of the skeins inspected according to **6.3** fails to meet the requirements of the relevant characteristics.

APPENDIX A

(*Clause* 3.3)

METHOD FOR DETERMINATION OF COPPER CONTENT

A-1. COPPER CONTENT

A-1.1 Cut from each skein in the test sample (*see* **6**) one test specimen weighing about 5 g.

A-1.2 The following apparatus shall be used for the purpose of this test:

a) A silica or porcelain crucible,
b) A muffle furnace capable of heating up to 450°C, and
c) A conical flask of 250-ml capacity.

A-1.3 The following reagents shall be used for the purpose of this test:

a) Sulphuric acid (2 N);
b) Potassium iodide crystals;
c) Sodium thiosulphate (0·1 N);
d) Ammonium thiocyanate;
e) Starch solution, approximately one percent aqueous solution;
f) Ammonium hydroxide solution, prepared by diluting ammonia (sp gr 0·88) in water to yield 1 : 1 (*v*/*v*) solution; and
g) Acetic acid (5 N).

A-1.4 Take one test specimen (*see* **A-1.1**) and dry it at 105 to 110°C to constant weight and determine its weight.

A-1.4.1 Cut the test specimen as obtained in **A-1.4** into small pieces. Place all the pieces in a tared silica or porcelain crucible. Slowly ignite the test specimen in the crucible over a Bunsen flame, transfer the crucible to the muffle furnace and ash at 450°C for an hour or more until it attains constant weight. Transfer the ash into a conical flask, and sufficient amount of sulphuric acid. Heat the contents in the flask to almost boiling until a clear solution appears. Filter the solution, if necessary. Add ammonium hydroxide or sodium carbonate to neutralize the sulphuric acid. Make the neutral solution acidic with acetic acid and add about 2 to 3 g of potassium iodide to the solution. Shake the contents in the flask at intervals for five minutes. Add 50 ml of distilled water and titrate the liberated iodine with sodium thiosulphate using freshly prepared starch as indicator. Add 2 g of ammonium thiocyanate to the mixture towards the end of the titration to sharpen the end point.

A-1.5 Calculate the copper content, percent, of the specimen using the following formula:

$$C = \frac{0{\cdot}006\,357 \times V}{W_1} \times 100$$

where

C = copper content, percent;

V = volume, in ml, of 0·1 N sodium thiosulphate; and

W_1 = oven-dry weight in g of the test specimen.

A-1.6 Repeat the test with the remaining test specimens (*see* **A-1.1**).

A-1.7 Calculate the average of the values as obtained in **A-1.5** and **A-1.6.**

A-1.8 Report the lot to be in conformity with the requirements of **3.3** if the condition laid down in sampling plan (*see* **6**) in respect of copper content is satisfied.

APPENDIX B

(*Clause* 0.3)

RECOMMENDED SI UNITS FOR TEXTILES

Sl No.	*Characteristic*	*SI Units*		*Application*
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
1.	Length	Millimetre	mm	Fibres
		Millimetre, centimetre	mm, cm	Samples, test specimens (as appropriate)
		Metre	m	Yarns, ropes, cordages, fabrics
2.	Width	Millimetre	mm	Narrow fabrics
		Centimetre	cm	Other fabrics
		Millimetre, centimetre	mm, cm	Samples, test specimens (as appropriate)
		Centimetre, metre	cm, m	Carpets, druggets, *DURRIES* (as appropriate)
3.	Thickness	Micrometre (micron)	μm	Delicate fabrics
		Millimetre	mm	Other fabrics, carpets, felts
4.	Linear density	Tex	tex	Yarns
		Millitex	mtex	Fibres
		Decitex	dtex	Filaments, filament yarns
		Kilotex	ktex	Slivers, ropes

5.	Diameter	Micrometre (micron) Millimetre	μm mm	Fibres Yarns, ropes, cordages
6.	Circumference	Millimetre	mm	Ropes, cordages
7.	Threads in fabric:			Woven fabrics (as appropriate)
	a) Lengthwise	Number per centimetre Number per decimetre	ends/cm ends/dm	
	b) Widthwise	Number per centimetre Number per decimetre	picks/cm picks/dm	
8.	Warp threads in loom	Number per centimetre	ends/cm	Reeds
9.	Stitches in knitted fabric:			Knitted fabrics (as appropriate)
	a) Lengthwise	Courses per centimetre Courses per decimetre	courses/cm courses/dm	
	b) Widthwise	Wales per centimetre Wales per decimetre	wales/cm wales/dm	
10.	Stitch length	Millimetre	mm	Knitted fabrics Made-up fabrics
11.	Mass per unit area	Grams per square metre	g/m^2	Fabrics
12.	Mass per unit length	Grams per metre	g/m	Fabrics
13.	Twist	Turns per centimetre Turns per metre	turns/cm turns/m	Yarns, ropes (as appropriate)
14.	Test or gauge length	Millimetre, centimetre	mm, cm	Fibres, yarns and fabric specimens (as appropriate)

Sl No.	Characteristic	SI Units		Application
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
15.	Breaking load	Millinewton . Newton	mN N	Fibres, delicate yarns (individual or skeins) Strong yarns (individual or skeins), ropes, cordages, fabrics
16.	Breaking length	Kilometre	km	Yarns
17.	Tenacity	Millinewton per tex	mN/tex	Fibres, yarns (individual or skeins)
18.	Twist factor or twist multiplier	Turns per centimetre × square root of tex Turns per metre × square root of tex	turns/cm × $\sqrt{\text{tex}}$ turns/m × $\sqrt{\text{tex}}$	Yarns (as appropriate)
19.	Bursting strength	Newton per square centimetre	N/cm^2	Fabrics
20.	Tear strength	Millinewton Newton	mN N	Fabrics (as appropriate)
21.	Pile height	Millimetre	mm	Carpets
22.	Pile density	Mass of pile yarn in grams per square metre per millimetre pile height	g/m^2/mm pile height	Pile carpets
23.	Elastic modulus	Millinewton per tex per unit deformation	mN/tex/unit deformation	Fibres, yarns, strands